

ing fossils like Nautilus and Trigonina linger here and there, but in Tanganyika we seem to see not odd members but a whole association of species preserved beyond the common span.

Albertville, Tanganyika, Congo-Belge, Central Africa.

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NOTES ON THE NOMENCLATURE OF SOME OF OUR EAST AMERICAN
SPECIES OF PECTEN WITH DESCRIPTIONS OF NEW SPECIES

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There has been in the past some confusion in regard to the names of our more common species of *Pecten*, and in revising the series in the National Museum, it seemed desirable to put them on a sound basis by scrutinizing carefully the original sources. This has led to the cleaning up of some doubtful points as will be seen by the following data.

Pecten (Placopecten) grandis Solander

Ostrea grandis Solander, Portland Cat., p. 50, No. 486; p. 99, No. 2168, 1786.

Ostrea magellanica Gmelin, Syst. Nat., p. 3317, 1792.

Pecten tenuicostatus Mighels, Proc. Boston Soc. Nat. Hist. IV, p. 41, pl. 4, fig. 7, 1842 (young shell).

Pecten fuscus Linsley, Am. Journ. Sci., vol. 48, p. 276, 1845 (nude name); Gould, Am. Jour. Sci., 2nd ser. VI, p. 235, fig. 6, Sept., 1848 (young shell). Not *fuscus* of Gmelin, 1792.

Pecten brunneus Stimpson, New England Shells, p. 48, 1851 (new name for *P. fuscus* Linsley).

Pecten (Placopecten) clintonius Verrill, Trans. Conn. Acad. VI, p. 261, 1884 (not of Say).

Pecten (Placopecten) grandis Dall, Trans. Wagner Inst. III, pt. 4, p. 727, 1898.

This species has been dredged in rather deep water from Labrador to points off Cape Hatteras, North Carolina.

There is a marked difference between varieties of this species; the young form has the radiating sculpture minutely imbricate, a feature which is sometimes persistent in the adult, while in the majority of specimens the imbrication is wanting after ado-

lescence. In color the species varies from pale to dark purplish, rare individuals show dark and pale radiations.

Pecten (Plagioctenium) gibbus Linné

Ostrea gibba Linné, Syst. Nat. ed. X, p. 698, 1758.

Ostrea flabellum Gmelin, Syst. Nat., p. 3321; 1792 (after Regenfuss, Conch. I, pl. 9, fig. 33).

Pecten lineolaris Lamarck, An. s. Vert. VI, p. 166, No. 12, 1819.

Pecten dislocatus Say, Journ. Acad. Nat. Sci. Phila., 1st ser. II, p. 260, 1822; Am. Conch., pt. 6, pl. 56, figs. 2, 2a, 1834 (Encycl. Méth. pl. 213, fig. 3, not named), Binney's Say, p. 214, pl. 56, f. 2, 2a 1858.

Pecten purpuratus Conrad, Am. Marine Conch., p. 10, pl. 2, fig. 1, 1831; not of Lamarck, An. s. Vert. VI. p. 165, 1819.

Pecten (Plagioctenium) gibbus Dall, Trans. Wagner Inst. III, pt. 4, p. 745, 1898.

Found in comparatively shallow water from North Carolina to the Antilles.

This is the common *Pecten* of the southern shores from the Carolinas to the Antilles. It varies in color to a remarkable extent, but never reaches the size of its northern relatives. *Pecten sowerbi* Guilding, 1826, is supposed to be one of the Antillean color varieties. The number of ribs in the typical form averages twenty, none examined had less than eighteen and only one out of 154 had as many as twenty-three. A specimen from West Africa is exactly matched by one from Florida, though the African form seems to show few of the brilliant colors common with the Antillean varieties.

Pecten gibbus, variety *amplicostatus* Dall

Pecten gibbus, var. *amplicostatus* Dall, Trans. Wagner Inst. III, pt. 4, p. 747, 1898. Texas Coast to Carthagea.

This is a larger and heavier form than the typical *gibbus*. It has from twelve to fifteen strong flattish ribs and all the specimens seen have the lower valve white and the upper valve of a grayish color. It is also found in the Florida Pliocene.

After study of a multitude of specimens, I am now inclined to separate specifically from *P. gibbus* the forms formerly regarded as variety *nucleus* and *irradians*. This was also Stimp-

son's opinion, expressed in his unpublished manuscript in my possession.

Pecten (Plagiectenium) irradians Lam.

Pecten irradians Lamareck, Ann. s. Vert. VI, p. 173, 1819; Chenu, Ill. Conch. III, p. 8, pl. 39, figs. 10, 11, 1843; Sowerby, Thes. Conch., *Pecten*, p. 62, pl. 17, figs. 139, 140, 1842; Reeve, Conch. Icon., *Pecten*, pl. 6, fig. 26, 1852; W. G. Binney's Gould's Invert. Mass., fig. 496, 1870. Not of Potiez et Michaud, Gal. de Douai, II, p. 87, pl. 91, fig. 6, 1844.

Pecten concentricus var. *borealis* Say, Journ. Acad. Nat. Sci. Phila. II, p. 260, 1822.

Pecten concentricus Conrad, Am. Marine Conch., pt. 1, p. 8, pl. 1, figs. 2, 3, 1831; Gould, Invert. Mass., p. 134, fig. 88, 1841; not of Say.

Pecten turgidus Sowerby, Genera, Rec. and Fossil Shells, pt. 31, fig. 1, 1825; not of Gmelin, 1792.

Pecten (Plagiectenium) gibbus borealis Johnson, Fauna of New England, Moll., p. 29.

Ranging from Nova Scotia to Florida and Texas, but abundant only to the northward.

This is the characteristic New England form, large, thin shelled, rather compressed, gray and white with rarely a dull red, yellow or brownish variation, the ribs averaging 17 to 20, the basal margin with prominently acute scalloping.

Potiez and Michaud describe this shell as having an imbricate elevated thread in the channels between the ribs, which never occurs in this species. Their text says it has twenty ribs, but their figure shows twenty-eight.

In the south, perhaps by hybridization, the valves sometimes take on a more inflated form and heavier shell, intermediate between the northern form and the variety *concentricus*, usually with a larger number of ribs than in the latter form.

Pecten irradians var. *concentricus* Say

Pecten concentricus Say, Journ. Acad. Nat. Sci. Phila., 1st ser. II, p. 259, 1822.

Coast of New Jersey to Hog Island, Eastern shore of Virginia, and South Carolina.

This form which agrees closely with Say's description, differs

from the typical *irradians* by being more inflated, more solid, with rather uniformly seventeen ribs, the lower valve is yellowish, sometimes slightly zoned with gray, the upper pretty uniformly bluish gray and somewhat flatter, the incremental lines prominent; the valves are white inside, sometimes blotched toward the margin with reddish brown. Full grown specimens have a length parallel to the hinge line of about 70 mm., and a diameter of 45 mm. This variety does not seem to have been figured.

Pecten (Plagiocentrum) nucleus Born

Ostrea nucleus Born, Index Mus. Caes, p. 92, 1778; Test. Mus. Vind., p. 107, pl. 7, fig. 2, 1780.

Ostrea turgida Gmelin, Syst. Nat. p. 3327, 1792 (after Chemnitz, Conch. Cab. VIII, p. 323, pl. 65, figs. 621, *a-b*, 1784). (Not of Sowerby, Genera, pt. 31, pl. 1, fig. 1, 1825).

Pecten nucleus Sowerby, Thes. Conch., *Pecten*, pl. 14, fig. 25, 1842; Reeve, Conch. Icon., *Pecten*, pl. 22, fig. 89, 1853.

Florida Keys to Venezuela.

Having examined a very large number of these shells, I find them exceedingly uniform in size and coloration, showing none of the bright colors of young *P. gibbus*, but maculated gray and white, sometimes both valves, but the lower valve is usually pure white. The shells are well inflated and thinner than young *gibbus* of the same size.

Pecten (Euvola) tereinus n. sp.

Shell small for the group, depressed, thin, pale, the colors when present delicate; the lower valve with about twenty-five low flattened ribs, with shallow not channeled interspaces, or with the ribs obsolete altogether, or ill defined; concentric sculpture weak; the ears subequal, hardly sculptured, the byssal notch shallow, with no ctenolium; internally the valve is white, the grooves corresponding to the ribs, extend over the whole disk and are well defined; upper valve flat or slightly concave, with about 19 narrow elevated not dichotomous ribs with wider interspaces; the concentric sculpture well marked; this valve is usually more effectively colored than the other; internally it is grooved like the other; the outline of the shell

is nearly circular, the hingeline short, the cartilage pit very small; height 28; length of valves 30; of hingeline 19; diameter 4 mm. U. S. Nat. Mus. Cat. No. 333632.

Miami Florida, to the Bahamas and south to Cape Roque, Brazil. The type specimen was dredged off Key West at station 3318 of the U. S. Fish Commission, in 45 fathoms, coral, bottom temperature 75° F.

This species differs from *P. raveneli*, its nearest relative, in the obsolescence of the external ribbing, the absence of channelling and color in the spaces between the ribs; in the depressed form, and in the production of the internal grooving over the whole disk, while in *P. raveneli* it is confined to the more marginal portion. This latter feature is probably due to the thinner shell in *P. tereinus*. The coloration is uniformly more delicate and paler.

Pecten (Euvola) raveneli Dall

Pecten (Euvola) raveneli Dall, Trans. Wagner Inst. III, pt. 4, p. 721, pl. 29, fig. 10, 1898 (Pliocene).

Pecten medius of American catalogues.

The Antillean shell which has been commonly identified with *P. medius* Lamarck, is really a different species.

Ostrea (Pecten) medius Gmelin (Syst. Nat. 3330), based on Gualtieri's figures N, O, on plate 74, is really unidentifiable, but bears some resemblance to *Pecten fricatus* Reeve. *Pecten medius* Lamarck (An. s. Vert. VI, p. 163, 1819), is based on Chemnitz (Conch. Cab. VII, pl. 60, figs. 586-7) who states that his shell was received from Forskal who collected it in the Red Sea. The name *medius* in this connection is preoccupied by Gmelin. Sowerby in the Thesaurus states that his *P. medius* Lamarck, was labeled *P. laticostatus* in the British Museum collection. But this name is preoccupied by Lamarck for a fossil species, "the largest known *Pecten*," a giant eight inches in breadth. None of the figures attributed to *P. medius* Lamarck can be identified with the true West Indian shell; Reeve especially (Conch. Icon., fig. 44) gives a large figure which is neither Lamarck's *P. medius* nor a West Indian species. Apparently none of the authors who have copied references

from one another and applied them to various different species were acquainted with our shell, at any rate they have not figured it. A description follows, since the Pliocene form has lost its color.

Shell of moderate size, thin, the lower valve much inflated, the upper valve slightly concave or nearly flat; the latter with a straight hingeline and almost exactly equal ears, each with four or five subequal minutely imbricate radial ridges; radial sculpture of the disk about twenty-five low-rounded ribs with sub-equal interspaces in which toward the margin traces of incipient intercalary threads may appear; the concentric sculpture is of prominent fine low lamellae overrunning the whole surface; internally the ears are prominent, the margin deeply radially grooved, the grooves extending about halfway over the disk, the wider interspaces flattish, with paired elevated lines at their margins; the hingeline is finely cross-striated, with a groove on each side of the cartilage pit to receive a slender lateral ridge from the opposite valve. The lower valve is pale with about twenty-six strong flattish radial ribs with narrower channeled interspaces faintly marked with concentric incremental lines; the ribs toward the margin are in adult shells divided by a shallow median groove; in many specimens the interspaces between the ribs are marked with a conspicuous brown line; the ears are subequal, somewhat reflexed and feebly sculptured; there is only a shallow byssal notch without a ctenolium; the internal grooving resembles that of the other valve but extends somewhat further toward the umbo; the basal margin is notched by the sculpture; height of shell, 40; length, 47; length of hingeline, 24; diameter, 12 mm. U. S. Nat. Mus. Cat. No. 333634.

The shell described was collected by Captain Jefferson Moser, U. S. N., at St. Martin's Reef, Florida, in three fathoms. The range of the recent form is indicated by specimens from North Carolina and Bermuda to Porto Rico, in the Museum collection.

The coloration is mostly white and pinkish, often with brownish lines in the grooves of the lower valve. The interior is usually white, with more or less color around the margin.

The Pliocene form to which the name *raveneli* was first ap-

plied is somewhat coarser than its recent representative, but I think there can be little doubt of their specific identity.

Pecten (Chlamys) ornatus Lamarck

?*Ostrea sauciata* Gmelin, Syst. Nat. p. 3328, 1792, after Chemnitz, Conch. Cab. VII, pl. 69, fig. H, 1783. Dillwyn, Rec. Shells 1, p. 161, 1817.

?*Ostrea crenulata* Gmelin, Syst. Nat. p. 3329, 1792, after Lister, pl. 175, fig. 12a. (left).

Pecten ornatus Lamarck, An. s. Vert. VII, p. 176, No. 50, 1819; Conrad, Am. Marine Conch. pt. 1, p. 12, fig. 3, 1831; Sowerby, Thes. Conch., *Pecten* pl. 14, figs. 77-78, 1842; Reeve, Conch. Icon., *Pecten*, pl. 19, fig. 68, 1853.

Chemnitz's figure 69 is poor and the species can hardly be regarded as identifiable. *Ostrea crenulata* Gmelin is referred by Dillwyn to the *P. radula* of authors, the largest figure on Lister's plate; but Gmelin's reference is apparently for the left lower figure of Lister, which seems to represent our shell. However some doubt must attach to this identification.

The first positively identifiable name for this species is Lamarck's *ornatus* for which he cites the same figure of Lister as that used by Gmelin for *O. crenulata*.

This shell is white, elegantly sparsely spotted with purple, the ribs are usually worn smooth and rather strong, though originally they were covered with extremely fragile cup-like imbricating lamellae which are very rarely intact. Of the 20 ribs, three are usually untouched by the purple color. The posterior ear is almost obsolete. Our largest specimen is about 26 mm. in height.

Pecten (Chlamys) sentis Reeve

?*Pecten sentis* Reeve, Conch. Icon., *Pecten*, pl. XXIX, fig. 125, 1853.

Pecten ornatus (var.) most lists of Antillean Pectens.

This is a common south Florida and West Indian shell, usually referred to as *Pecten ornatus* though perfectly distinct when carefully studied. The shell is usually bright scarlet or dull purple, paler toward the umbones, very rarely white or white with maculations or rays. When fully adult it has about forty

fine ribs, more or less alternated, which when unworn carry minute erect low scales which bridge the interspaces and connect laterally with those on the adjacent ribs to a greater or less extent. This sculpture is lost, but leaves traces on most beach specimens. The posterior ear is hardly developed, the anterior much larger. The interior is white, grooves reflecting the external sculpture. The byssal notch is wide and shallow. Both valves are usually similarly colored. Our largest specimen is 36 mm. high, 30 mm. wide, and the pair has a diameter of about 10 mm.

Reeve's shell is obscurely figured and insufficiently described, without a habitat, but as far as the characters given go, they agree with those of this species.

Pecten (Chlamys) liocymatus n. sp.

Shell (right valve) small, oblique, moderately convex, with about 20 low rounded entire ribs with narrower shallow interspaces; the surface somewhat worn, is smooth except for concentric lines of growth which may originally have been more prominent; profile subcircular, the ears small, subequal, with a few radiating threads on the anterior ear; the byssal notch shallow; the interior partly grooved in harmony with the external ribs, the edges of the flat interspaces threaded; hinge line straight, in the right valve with a groove each side of the resilifer to receive a corresponding ridge from the opposite valve, these grooves are sharply cross-striated; height, 30; width of shell, 28; of hinge line, 16; diameter (of right valve), 5 mm. U. S. Nat. Mus. Cat. No. 62290.

Dredged by the U. S. Fish Commission steamer Albatross at station 2604, in 34 fathoms, sand, bottom temperature 79° F., 39 miles off Cape Hatteras, North Carolina; two right valves.

These specimens, perhaps originally white, have been discolored by the action of the sea water. I have not been able to find any species recent or fossil which is at all closely related to this one.

Pecten (Aequipekten) heliacus n. sp.

Shell of moderate size, more or less mottled and zoned in

pinkish and crimson on a white surface, outline subcircular, very slightly oblique; ribs about 20, not dichotomous distally; narrow, almost keeled, with wider interspaces; valves equal, inequilateral, the ears subequal, the byssal notch wide and shallow, with a ctenolium of four teeth; the right valve somewhat paler than the other; the microscopic surface sculpture comprises a row of small pointed scales on top of the ribs, a smaller series on each side of each rib and 3 or 4 much finer prickly threads in the bottom of the channels between the ribs; the interior of the valve is more or less clouded with brownish purple, grooved to correspond to the external ribs, the ends of the flatish interspaces slightly excavated, the resilifer rather large; height, 38; length of valves, 40; of hinge line, 41; diameter, 11 mm. U. S. Nat. Mus. Cat. No. 333635.

Bahamas, *vide* W. F. Webb.

This species has the general appearance of *P. phrygium* Dall, with which it had been placed in the collection, but the microscopic surface is quite different.

Pecten (Aequipecten) acanthodes n. sp.

Shell of moderate size, subcircular, olivaceous brown with small paler mottlings; with 22 minutely spinose ribs, the spines in three subequal rows, with two or three smaller prickly threads in the narrower interspaces, the spines are excavated on the dorsal surface, more prominent laterally and on the upper border of the hinge-line; ears subequal, the anterior slightly larger, both with about five radiating spinose threads; byssal notch shallow, the ctenolium with eight teeth; internally the color and sculpture reflect that of the exterior; the flat interspaces between the grooves marginally threaded; hinge-line cross-striated and feebly longitudinally grooved; height, 32; width of shell, 32; of hinge-line, 26; diameter, 11 mm. U. S. Nat. Mus. Cat. No. 333697.

Range from Southern Florida to the Antilles.

Than *P. exasperatus* this shell is less inflated, wider, and with less prominent spines. All the specimens seen are uniformly colored.